

IN THE CLAIMS

What is claimed is:

1. (Currently Amended) A computer program product having computer program code embodying an encoded set of processor based instructions on a computer readable medium for performing, via a processor responsive to the instructions, a method of organizing and generating report data renderable on a graphical user output device indicative of a plurality of manageable entities in a managed information network comprising:
 - determining an output criteria applicable to a set of data, the set of data having entries including fields, to compute an ordered output display set adapted for inclusion in a report, the determined output criteria including:
 - a selection criteria indicative of output records for inclusion in a set of the candidate entries selected from the entries; and
 - an arrangement criteria indicative of display formatting applicable to the candidate entries;
 - parsing, in a first pass, a plurality of entries in the set of data;
 - applying, during the first pass, the determined output criteria to a portion of each parsed entry to compute a subset of candidate entries, the selection criteria including a filtering criteria defining the portion as fields in the entries deterministic of the entries in the output records, applying further comprising filtering according to the filtering criteria, the filtering operable to designate a subset of entries for inclusion in the first pass by defining the portion and the filtering criteria operable on at least one of the fields for comparison and selective inclusion in the designated subset;
 - retaining in a memory, in the first pass, only the selection and arrangement criteria fields;
 - parsing, in a second pass, the computed subset of candidate entries, the second pass performed on the same set of data unmodified from the first pass;
 - omitting from a memory, in the second pass, entries in the parsed plurality of entries outside the candidate set; and

processing, during the second pass, the computed subset of candidate entries according to the determined output criteria to generate the ordered output display set of entries in a tangible medium of expression on the graphical user output device.

Claims 2 -3. (Canceled)

4. (Previously Presented) The method of claim 1 further comprising retaining in a memory, in the first pass, only the selection and arrangement criteria fields.

5. (Previously Presented) The method of claim 1 wherein the selection criteria corresponds to displayable entries operable for simultaneous display on an output device.

6. (Previously Presented) The method of claim 1 wherein the arrangement criteria is indicative of ordering logic applicable to a subset of fields each of the entries based on a comparison of the fields in the entries.

7. (Original) The method of claim 6 wherein the ordering logic processes at least one of the fields according to ascending or descending values.

8. (Original) The method of claim 1 wherein the determined output criteria is operable on key fields of the entries, the key fields having scalar values operable for comparison.

9. (Original) The method of claim 1 wherein the set of data is arranged in a predetermined data set format, the data set format operable to designate entries corresponding to rows and fields corresponding to columns.

10. (Original) The method of claim 9 wherein the predetermined data set format defines a syntax having a nested structure conversant with a parser operable to perform the first parse and the second parse, the parser further operable to extract entries and fields in each of the entries according to rows and columns.

11. (Canceled)

12. (Original) The method of claim 1 wherein parsing further comprises generating parsing events for initiating callback operations, the callback operations operable on the data set according to predetermined logic.

13. (Original) The method of claim 12 wherein the parsing events correspond to predetermined syntactical structures, and the callback operations are operable for applying the determined output criteria on the entries in the data set.

14. (Original) The method of claim 13 wherein the callback operations further include building the candidate set, filtering the entries in the data set, matching entries in the candidate set, sorting entries in the candidate set, and formatting entries in the candidate set.

15. (Original) The method of claim 1 wherein the first pass further comprises filtering entries for omission from the candidate set and comparing key fields in entries for inclusion in the candidate set.

16. (Original) The method of claim 1 wherein the second pass further comprises matching entries for inclusion in the candidate set, sorting entries in the candidate set, and formatting entries in the candidate set for display on the output device.

17. (Currently Amended) A data management device for organizing and generating report data indicative of a plurality of manageable entities renderable on a graphical user output device in a storage area network (SAN) comprising:

an infrastructure monitor operable for receiving an output criteria applicable to a set of data, the set of data having entries including fields, to compute an ordered output display set adapted for inclusion in a report, the determined output criteria including:

a selection criteria indicative of output records for inclusion in a set of the candidate entries selected from the entries; and

an arrangement criteria indicative of display formatting applicable to the candidate entries, the set of data arranged in a predetermined data set format, the data set format operable to designate entries corresponding to rows and fields corresponding to columns;

a parser in the infrastructure monitor for parsing, in a first pass, a plurality of entries in the set of data, the parser operable to omit from a memory, in the second pass, entries in the parsed plurality of entries outside the candidate set;

a first handler in the parser for applying, during the first pass, the determined output criteria to a portion of each parsed entry to compute a subset of candidate entries, further comprising a filter handler operable according to a filtering criteria defining the portion as fields in the entries deterministic of the entries in the output records, the filtering operable to designate a subset of entries for inclusion in the first pass by defining the portion and the filtering criteria operable on at least one of the fields for comparison and selective inclusion in the designated subset;

a memory for retaining, in the first pass, only the selection and arrangement criteria fields;

a second handler in the parser for parsing, in a second pass, the computed subset of candidate entries, the second pass performed on the same set of data unmodified from the first pass, the parser operable to process, during the second pass, the computed subset of candidate entries according to the

determined output criteria to generate the ordered output display set of entries in a tangible medium of expression on the graphical user output device.

Claims 18 -19. (Canceled)

20. (Previously Presented) The data management device of claim 17 wherein the parser is operable to retain, in a memory, in the first pass, only the selection and arrangement criteria fields.

21. (Previously Presented) The data management device of claim 17 wherein the selection criteria corresponds to displayable entries operable for simultaneous display on an output device.

22. (Previously Presented) The data management device of claim 17 wherein the arrangement criteria is indicative of ordering logic applicable to a subset of fields each of the entries based on a comparison of the fields in the entries.

23. (Original) The data management device of claim 22 wherein the ordering logic is operable to process at least one of the fields according to ascending or descending values.

24. (Original) The data management device of claim 17 wherein the determined output criteria is operable on key fields of the entries, the key fields having scalar values operable for comparison.

25. (Canceled)

26. (Previously Presented) The data management device of claim 17 wherein the predetermined data set format defines a syntax having a nested structure conversant with a parser operable to perform the first parse and the

second parse, the parser further operable to extract entries and fields in each of the entries according to rows and columns.

27. (Original) The data management device of claim 17 further comprising a filter handler operable according to a filtering criteria, the filtering operable to designate a subset of entries for inclusion in the first pass and the filtering criteria operable on at least one of the fields for comparison and selective inclusion in the designated subset.

28. (Original) The data management device of claim 17 wherein parsing is operable to generate parsing events for initiating callback operations, the callback operations operable to invoke handlers for performing operations on the data set according to predetermined logic.

29. (Original) The data management device of claim 28 wherein the parsing events correspond to predetermined syntactical structures, and the callback operations are operable for applying the determined output criteria on the entries in the data set.

Claim 30. (Canceled)

31. (Currently Amended) A method for efficient memory usage for organizing and generating report data indicative of a plurality of manageable entities in a storage area network (SAN) comprising:

determining, via a user input request, an output criteria applicable to a set of data, the set of data having entries including fields, to compute an ordered output display set adapted for inclusion in a report;

parsing, by a build set handler, in a first pass, a plurality of entries in the set of data;

filtering according to a filtering criteria, the filtering operable to designate a subset of entries for inclusion in the first pass and the filtering criteria operable on at least one of the fields for comparison and selective inclusion in the designated subset;

retrieving, during the parsing, a portion of each of the plurality of entries, the filtering criteria defining the portion as fields in the entries deterministic of the entries in the output display set, wherein the parsed entries in the first pass are inoperably~~excessively~~ large for concurrent memory residence;

applying, during the first pass, the determined output criteria to the retrieved portion of each parsed entry to compute a subset of candidate entries, the candidate entries computed by determination of a subset~~range~~ of entries from the set of data, the subset of entries~~range~~ operable for inclusion in a common display screen area, the first pass further comprising filtering entries for omission from the candidate set and comparing key fields in entries for inclusion in the candidate set;

retaining in a memory, in the first pass, only the selection and arrangement criteria fields;

parsing, by a match set handler, in a second pass, the computed subset of candidate entries to identify entries in the data set corresponding to the portions of entries in the candidate entries, the second pass performed on the same set of data unmodified from the first pass;

retrieving, by the match set handler, the entire entry corresponding to each of the portion of the entry in the candidate entries;

processing, by a sort handler, during the second pass, the computed subset of candidate entries according to the determined output criteria to generate complete entries of the entries in the candidate set, wherein the parsed entries of the second pass require substantial~~less~~ memory than the first pass such that the parsed entries of the second pass are stored simultaneously in memory, the second pass further comprising matching entries for inclusion in the

candidate set, sorting entries in the candidate set, and formatting entries in the candidate set for display on the output device;

formatting, by a format handler, the processed complete entries to generate the output display set of entries in a tangible medium of expression on a graphical user output device, the output display set of entries corresponding to the determined range and ordered according to the ordering logic; and

omitting from the memory, during the second pass, entries in the data set outside the output display set of entries.

32. (Currently Amended) A computer program product having a computer readable medium operable to store computer program logic embodied in an encoded set of processor based instructions encoded thereon for performing, via a processor responsive to the instructions, organizing and generating report data renderable on a graphical user output device indicative of a plurality of manageable entities in a managed information network comprising:

computer program code for determining an output criteria applicable to a set of data to compute an ordered output display set adapted for inclusion in a report, the set of data having entries including fields, the determined output criteria including:

a selection criteria indicative of output records for inclusion in a set of the candidate entries selected from the entries, the selection criteria including a filtering criteria, applying further comprising filtering according to the filtering criteria, the filtering operable to designate a subset of entries for inclusion in the first pass and the filtering criteria operable on at least one of the fields for comparison and selective inclusion in the designated subset; and

an arrangement criteria indicative of display formatting applicable to the candidate entries;

computer program code for parsing, in a first pass, a plurality of entries in the set of data;

computer program code for applying, during the first pass, the determined output criteria to a portion of each parsed entry to compute a subset of candidate entries, the output criteria defining the portion as fields in the entries deterministic of the entries in the output records;

retaining in a memory, in the first pass, only the output criteria fields;

computer program code for parsing, in a second pass, the computed subset of candidate entries, the second pass performed on the same set of data unmodified from the first pass;

computer program code for omitting from a memory, in the second pass, entries in the parsed plurality of entries outside the candidate set; and

computer program code for processing, during the second pass, the computed subset of candidate entries according to the determined output criteria to generate the ordered output display set of entries in a tangible medium of expression on the graphical user output device.

Claim 33. (Canceled)

34. (Currently Amended) A data management device for organizing and generating report data indicative of a plurality of manageable entities renderable on a graphical user output device in a storage area network (SAN) comprising:

means for determining an output criteria applicable to a set of data, the set of data having entries including fields, to compute an ordered output display set adapted for inclusion in a report, the determined output criteria including:

a selection criteria indicative of output records for inclusion in a set of the candidate entries selected from the entries, the selection criteria including a filtering criteria, applying further comprising filtering according to the filtering criteria, the filtering operable to designate a subset of entries for inclusion in the first pass and the filtering criteria operable on at least one of the fields for comparison and selective inclusion in the designated subset; and

an arrangement criteria indicative of display formatting applicable to the candidate entries;

means for parsing, in a first pass, a plurality of entries in the set of data;

means for applying, during the first pass, the determined output criteria to a portion of each parsed entry to compute a subset of candidate entries, the output criteria defining the portion as fields in the entries deterministic of the entries in the output records;

retaining in a memory, in the first pass, only the output criteria fields;

means for parsing, in a second pass, the computed subset of candidate entries, the second pass performed on the same set of data unmodified from the first pass;

means for omitting from a memory, in the second pass, entries in the parsed plurality of entries outside the candidate set; and

means for processing, during the second pass, the computed subset of candidate entries according to the determined output criteria to generate the ordered output display set of entries in a tangible medium of expression on the graphical user output device.

35. (Currently Amended) A method for organizing and generating report data indicative of a plurality of manageable entities renderable on a graphical user output device in a managed information network comprising:

determining an output criteria applicable to a set of data, the set of data having entries including fields, to compute an ordered output display set adapted for inclusion in a report, the determined output criteria including:

a selection criteria indicative of output records for inclusion in a set of the candidate entries selected from the entries, the selection criteria including a filtering criteria, applying further comprising filtering according to the filtering criteria, the filtering operable to designate a subset of entries for inclusion in the first pass and the filtering criteria operable on at least one of the fields for comparison and selective inclusion in the

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designated subset, the selection criteria corresponding to displayable entries operable for simultaneous display on an output device; and

an arrangement criteria indicative of display formatting applicable to the candidate entries;

parsing, in a first pass, a plurality of entries in the set of data;

retaining in a memory, in the first pass, only the selection and arrangement criteria fields;

applying, during the first pass, the determined output criteria to a portion of each parsed entry to compute a subset of candidate entries, the output criteria defining the portion as fields in the entries deterministic of the entries in the output records;

parsing, in a second pass, the computed subset of candidate entries, the parsed entries of the second pass requiring ~~substantially~~ less memory than the first pass such that the parsed entries of the second pass are stored simultaneously in memory, the second pass performed on the same set of data unmodified from the first pass;

omitting from a memory, in the second pass, entries in the parsed plurality of entries outside the candidate set; and

processing, during the second pass, the computed subset of candidate entries according to the determined output criteria to generate the ordered output display set of entries in a tangible medium of expression on a graphical user output device.

36. (Previously Presented) The method of claim 35 wherein parsing further comprises generating parsing events for initiating callback operations, the callback operations operable on the data set according to predetermined logic, the parsing events corresponding to predetermined syntactical structures, and the callback operations are operable for applying the determined output criteria on the entries in the data set, wherein the callback operations further include building the candidate set, filtering the entries in the data set, matching entries in

the candidate set, sorting entries in the candidate set, and formatting entries in the candidate set.

37. (Currently Amended) The method of claim 36 wherein the parsed entries in the first pass are ~~inoperably~~excessively large for concurrent memory residence.

38. (Canceled)

39. (Currently Amended) A method for organizing and generating report data indicative of a plurality of manageable entities in a managed information network comprising:

determining an output criteria applicable to a set of data to compute an ordered output display set adapted for inclusion in a report, the output criteria including a selection criteria and an arrangement criteria;

parsing, in a first pass, each of the entries in the set of data, the first pass examining partial entries of each of the entries in the set of data, the partial entries including a portion of fields in the entry;

retaining in a memory, in the first pass, only the selection and arrangement criteria fields;

applying, during the first pass, the determined output criteria to the portion of each parsed entry to compute a subset of candidate entries; applying including matching the selection criteria with the examined partial entries, the selection criteria defining the portion as fields in the entries deterministic of the entries in the output display set;

parsing, in a second pass, the computed subset of candidate entries, the parsing performed on the same set of data unmodified from the first pass;

loading, during the second pass, only entries in the computed subset of candidate entries, loading including entire entries of the entries in the computed subset;

processing, during the second pass, the computed subset of candidate entries according to the determined output criteria to generate the ordered output display set of entries; the second pass consuming ~~substantially~~ less memory than the first pass;

avoiding, during the first pass and the second pass, loading the entire set of data simultaneously in memory, the set of data being ~~inoperably~~excessively large for concurrent memory residence; and

presenting the ordered output display set of entries on an output display device according to the arrangement criteria, the arrangement criteria indicative of a subset of fields in each of the entries in the display set of entries.

40. (Previously Presented) The method of claim 39 wherein the second pass computes and displays a subset of entries corresponding to entries operable for display on a single display screen.

41. (Previously Presented) The method of claim 40 wherein the selection criteria and the arrangement criteria are each indicative of an independent portion of fields of the entries in the set of data.

42. (Previously Presented) The method of claim 41 wherein the first pass and the second pass do not load all record of the set of data simultaneously in memory during the steps of parsing and processing.

43. (Previously Presented) The method of claim 42 wherein the selection criteria indicates a subset of fields different from a subset if fields indicated by the arrangement criteria.